

ACR (acute-to-chronic ratio)

For the purposes of the Methods Manual and this Opinion, the ACR is the LC50 divided by the NOEC.

action

All activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air

action area

All areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action

acute

short term exposure endpoint, often derived from toxicity tests that are 48-96 hours in duration. Acute often also connotes an illness that is of short duration, rapidly progressive.

anadromy/anadromous

migrating from the sea, upstream to spawn in freshwater

aquatic life criteria

Chemical concentration goals to protect surface water for aquatic life use. Issued by EPA pursuant to section 304(a) of the Clean Water Act.

allochthonous

derived from outside a system, such as leaves of terrestrial plants that fall into a stream

benthic

Of, relating to, or occurring at the bottom of a body of water

bioavailability

Degree of ability to be absorbed and ready to interact in organism metabolism.

bioaccumulation

When an organism absorbs a toxic substance at a rate greater than that at which the substance is lost

biological assessment(a.k.a. biological evaluation)

Refers to the information prepared by or under the direction of the Federal agency concerning listed and proposed species and designated and proposed critical habitat that may be present in the action area and the evaluation of potential effects of the action on such species and habitat

Biological Opinion

The document that states the opinion of the Service as to whether or not the federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat

bottleneck

A dramatic reduction in the size of a population (as of a species) that results in a decrease in genetic variation

brackish

Mixed fresh and salt water, found at the mouth of rivers where they enter salt water.

C_A

“Assessment exposure concentration” based on what exposure concentrations are allowed by the criterion

CCC (Criterion Continuous Concentration)

EPA’s chronic criterion recommendation. The CCC is derived from a set of chronic values, which are the geometric mean of the highest no observed effect concentrations and the lowest observed effect concentrations for survival, growth, or reproduction in tests which range from seven days to several months or more. Either by direct calculation or by the use of acute-to-chronic ratios (ACRs), the CCC is set to an estimated fifth percentile of chronic values.

CMC (Criterion Maximum Concentration)

EPA’s acute criterion recommendation. The CMC is derived from a set of LC50 values for a variety of aquatic species. To provide the preponderance of aquatic organism a level of protection much better than the 50% mortality, the CMC is set to one-half of the fifth percentile of the average acute values for the various genera tested.

CWA

The Clean Water Act. Formally, the Federal Water Pollution Control Act

CALFED

A group of state and federal agencies working together to develop long-term solutions to the problems affecting the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta system).

cassava

A plant (also called yucca)

cetacean

Any of an order (Cetacea) of aquatic mostly marine mammals that includes the whales, dolphins, porpoises, and related forms

chronic

long-term exposure, often derived from life-cycle or partial life cycle toxicity tests

chronic value

the geometric average of the NOEC and the LOEC. EPA aquatic life criteria development is based on the chronic value

conference

A process which involves informal discussions between a Federal agency and the Service under section 7(a)(4) of the Act regarding the impact of an action on proposed species or proposed critical habitat and recommendations to minimize or avoid the adverse effects

coniferous

Any of an order (Coniferales) of mostly evergreen trees and shrubs

constituent elements

Physical and biological features of designated or proposed critical habitat essential to the conservation of the species, including, but not limited to: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and (5) habitats that are protected from disturbance or are representative of the historic geographic and ecological distribution of a species

conservation recommendations

Suggestions of the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information

critical habitat

Specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been formally described in the Federal Register.

cumulative effects

Those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation

destruction or adverse modification

A direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical

direct effects

the direct or immediate effects of a project on the species or its habitat. Direct effects result from the agency action including the effects of interrelated actions and interdependent actions.

DPS (Distinct Population Segment)

A DPS, or a distinct population segment, is a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species. The ESA provides for listing species, subspecies, or distinct population segments of vertebrate species

EC_A

“Assessment effects concentration.” The ECA is the estimate of the highest chemical concentration in water or food that would cause an adverse effect to small percentage of a specified species population

EC₅₀

Median Effect Concentration – the concentration of a chemical which causes 50% of the organism to display effects including immobilization or loss of equilibrium in 48- to 96-hour laboratory tests

EPA

The United States Environmental Protection Agency

effects of the action

The direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline

indirect effects

Those effects that are caused by the proposed action and are later in time, but still are reasonably certain to occur

interrelated actions

Those actions that are part of a larger action and depend on the larger action for their justification

interdependent actions

Those actions that have no independent utility apart from the action under consideration

endangered

Any species which is in danger of extinction throughout all or a significant portion of its range

environmental baseline

The past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process.

ESU (Evolutionary Significant Unit)

An ESU, or evolutionarily significant unit, is a Pacific salmon population or group of populations that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species

FAV (Final Acute Value)

An estimate of the concentration of the material corresponding to a cumulative probability of 0.05 in the acute toxicity values for the genera with which acceptable acute tests have been conducted

formal consultation

A process between the Service and the Federal agency that commences with the Federal agency's written request for consultation under section 7(a)(2) of the Act and concludes with the Service's issuance of the biological opinion under section 7(b)(3) of the Act

freshet

A great rise or overflowing of a stream caused by heavy rains or melted snow

glacial till

Unstratified glacial drift consisting of clay, sand, gravel, and boulders intermingled

glacial outwash

Detritus consisting chiefly of gravel and sand carried by running water from the melting ice of a glacier and laid down in stratified deposits

grab sample

A rapid collection single point sampling method that does not integrate vertical or cross sectional variability, but captures point concentrations near the water's surface

ICE (Interspecies Correlation Estimates)

One of two models for estimating acute toxicity for endangered species up through the taxonomic level of family, where acute toxicity data are not available for the species of interest, and data for surrogate species must be used. Because toxicity tests have been conducted on few federally-listed species a majority of the assessments are likely to be made using surrogate species.

Igneous rock

One of three main types of rock. Igneous rock is formed by magma cooling and becoming solid

incidental take

Refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant

informal consultation

An optional process that includes all discussions, correspondence, etc., between the Service and the Federal agency or the designated non-Federal representative prior to formal consultation, if required

inceptisols

A soil order that forms quickly and lacks clay or organic matter

interspecific competition

Individuals of *different* species vie for the same resource in an ecosystem (e.g. food or living space).

interstitial

Space between things, such as rocks, cobble, or sediment

jeopardize the continued existence of

To engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species

LC₅₀

Median Lethal Toxicant Concentration. The concentration of an effluent or toxicant that causes mortality in 50% of the exposed organism, generally used in acute toxicity tests 48-96 hours in duration.

LOEC

Lowest Observable Effects Concentration. The LOEC is the test concentration immediately above the highest tested concentration that did not result in a statistically significant change in a particular toxicological variable compared to that value in the control (ASTM 2001).

LTAF

Lethality Threshold Adjustment Factor

lacustrine

Of, relating to, formed in, living in, or growing in lakes

legacy chemical

A chemical that is slow to degrade in an environment and tends to persist

listed species

Any species of fish, wildlife, or plant which has been determined to be endangered or threatened under section 4 of the Act. Listed species are found in 50 CFR 17.11-17.12

mark-recapture

A method commonly used in ecology to estimate population size and population vital rates (i.e., survival, movement, and growth)

mesocosm

An experimental apparatus or enclosure designed to approximate natural conditions, and in which environmental factors can be manipulated

microcosm

A small, representative system having analogies to a larger system

myocardium

A type of highly oxidative involuntary striated muscle found in the walls of the heart

NOEC

No Observable Effects Concentration. The NOEC is the test concentration immediately below the lowest tested concentration that resulted in a statistically significant change in a particular toxicological variable compared to that value in the control (ASTM 2001).

nekton

Free-swimming aquatic animals essentially independent of wave and current action

nematode

Any of a phylum (Nematoda or Nemata) of elongated cylindrical worms parasitic in animals or plants or free-living in soil or water

neritic

Of, relating to, inhabiting, or constituting the belt or region of shallow water adjoining the seacoast

pathway

The means by which a pollutant is transported from one location to another. Pollutants are released along three primary route through air land or water and may traverse multiple pathways over time

pelagic

Of, relating to, inhabiting, or constituting the belt or region of shallow water adjoining the seacoast

perennial

Persisting for several years usually with new herbaceous growth

phenotypic

The observable properties of an organism that are produced by the interaction of the genotype and the environment

pinniped

Any of an order or suborder (Pinnipedia) of aquatic carnivorous mammals (as a seal or walrus) with all four limbs modified into flippers

population

A group of individual organisms that live in a given area and share a common genetic heritage

primary constituent elements

Known physical and biological features within the designated area(s) that are essential to the conservation of the species and that may require special management considerations or protection. These essential features may include, but are not limited to, breeding/nesting areas, food resources, water quality and quantity, and vegetation and soil types

proposed critical habitat

Habitat proposed in the *Federal Register* to be designated or revised as critical habitat under section 4 of the Act for any listed or proposed species

proposed species

Any species of fish, wildlife, or plant that is proposed in the *Federal Register* to be listed under section 4 of the Act

pyrolysis

The chemical decomposition of organic materials by heating in the absence of oxygen or any other reagents, except possibly steam

R

R is the risk ration, where $R = CA/ECA$ where CA is the exposure water concentration (the criterion concentration), and ECA is the water concentration (or the dietary concentration) estimated to be of concern for a particular endangered or threatened species

RPA (reasonable and prudent alternative)

Alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat

RPM (reasonable and prudent measures)

Those actions the Director believes necessary or appropriate to minimize the impacts, *i.e.*, amount or extent, of incidental take

recovery

An improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act

redd

A spawning nest of eggs laid by a fish, especially salmon and steelhead

red tide

Seawater discolored by the presence of large numbers of dinoflagellates (especially of the genera *Gonyaulax* and *Gymnodinium*) which produce a toxin poisonous especially to many forms of marine vertebrate life

revetment

A facing (as of stone or concrete) to sustain an embankment

rhizome

A somewhat elongate usually horizontal subterranean plant stem that is often thickened by deposits of reserve food material, produces shoots above and roots below, and is distinguished from a true root in possessing buds, nodes, and usually scalelike leaves

riparian

Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater

SSD (Species Sensitivity Distribution)

One of two models for estimating toxicity to endangered species. If several surrogate species within the same taxonomic unit as the species of interest have been the subject of acute toxicity tests, they can be used to estimate the species sensitivity distribution (SSD) of that taxonomic unit, and thus define possible LC_{50} for the species of interest

sedimentary rock

A type of rock formed by sedimentation that settles to the bottom of a water body.

semelparous

Reproducing or breeding only once in a lifetime

senescence

The state of being old. A female is **reproductively senescent** if she is in a post reproductive state and can no longer reproduce because of age-related changes to her reproductive system

The Services

The U.S. Fish and Wildlife Service and the National Marine Fisheries Service, collectively

species

Species, subspecies, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature (16 U.S.C 1533).

threatened

Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range

vitellogenesis

Process of yolk formation via nutrients being deposited in the female germ cell

volatile

Readily able to vaporize

weirs

A fence or enclosure set in a waterway for taking fish